

ABSTRACT

**[0045]** An electrode element for plasma torches and a production method for such electrode elements. The electrode element for plasma torches includes at least one core made of a metal or a metal alloy having a smaller work function that forms the actual electrode connected as a cathode. This core is enclosed by a shell part, which is made of a metal or a metal alloy having a greater work function than the core and a greater thermal conductivity. Between the core surface and the shell part there is provided a boundary layer in a graded form, which is made up of solid solutions of the two metals or metal alloys, or an intermediate layer toward the core surface and toward the shell part, which is made of another metal or a metal alloy having a work function greater than that of the core material wherein the boundary layers of the intermediate layer form a graded transition.